IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF GEORGIA
BRUNSWICK DIVISION

SANDRA KAY TRICKETT,

Plaintiff,

v.

ADVANCED NEUROMODULATION SYSTEMS, INC.,

Defendant.

Civil Action No. CV207-016

DEFENDANT'S RULE 26(a)(2)(A) AND 26(a)(2)(B)
EXPERT DISCLOSURES

NOW COMES Defendant and pursuant to Rule 26(a)(2)(A) and 26(a)(2)(B) of the Federal Rules of Civil Procedure, hereby discloses the following individuals and required information pursuant to said rules.

1. Rule 26(a)(2)(A) Disclosures

a. Mr. Benjamin A. Tranchina

Defendant discloses that Benjamin A. Tranchina, Director of Electrical Engineering, Advanced Neuromodulation Systems, Inc., may be used at trial to present evidence under Rules 702, 703 or 705 of the Federal Rules of Evidence. Mr. Tranchina was extensively involved in the design and development of the EON Implantable Pulse Generator and may be called upon to testify, among other things, on design issues, the FDA approval process, complaints raised by Plaintiff and the causes of those complaints, and/or any testing performed on the explanted devices. His opinions are summarized in a Supplemental Discovery Response, which has been contemporaneously produced to Plaintiff.

b. Messrs. Danny Srader & Lee Edeker

Both Messrs. Srader and Edeker are technicians employed by Advanced Neuromodulation Systems, Inc., who examined and performed various tests on the EON Implantable Pulse Generators explanted from Plaintiff. Messrs. Srader and Edeker are expected to testify concerning the testing each of them performed. To the extent their testimony requires them to render expert opinions, notice of such is herein given.

Neither Messr. Trachina, Srader nor Edeker are specially employed to provide expert testimony, nor do their duties regularly involve giving expert testimony, as none of them have been designated as experts on behalf of ANS, Inc. prior to this case.

2. Rule 26(a)(2)(B) Disclosures

Defendant designates **Dr. Giancarlo Barolat**, as a retained expert who may testify at the trial of the above-captioned case. A report containing his opinions and supporting bases is attached hereto. Dr. Barolat has reviewed the documents identified in his report and at trial may use as an exhibit the actual explanted devices and any document produced in this case, including those documents referred to in his report.

Appended to Dr. Barolat's report is his *curriculum vitae*, which summarizes his qualifications. Dr. Barolat has written numerous articles, which are noted in the attachment accompanying his *curriculum vitae*. Dr. Barolat has not been retained as an expert in any litigation during the preceding four year period.

Dr. Barolat's rates are contained in the rate fee schedule accompanying his *curriculum vitae*.

Respectfully submitted this 20th day of August, 2007.

HUNTER, MACLEAN, EXLEY & DUNN, P.C.

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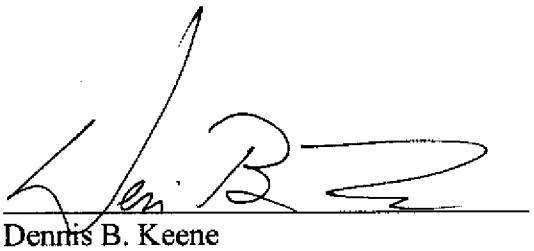
Attorneys for Advanced Neuromodulation Systems, Inc.

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a copy of the within and foregoing **Defendants' First Notice of Expert Disclosures Pursuant to Fed.R.Civ.P. 26** upon all parties to this matter by depositing a true copy of same in the U.S. Mail, proper postage prepaid, properly addressed to the following:

Ashleigh Madison
R. Bartley Turner
Savage, Turner, Pinson & Karsman
304 East Bay Street
Post Office Box 10600
Savannah, GA 31412

This 20th day of August, 2007.



Dennis B. Keene

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REPORT OF DR. GIANCARLO BAROLAT

I am a board certified neurosurgeon who has implanted approximately 6,000 spinal cord stimulators over the course of the past thirty years. A copy of my curriculum vitae and list of publications and lectures is attached to this report at tab "A".

I reviewed the following information in preparing my opinions contained herein:

A. Original and Supplemental Report of Dr. Richard Rauck;
B. Original and Supplemental Report of Edward Palmer;
C. Excerpt - Plaintiff's Response to ANS's Interrogatory No. 7;
D. Medical records pertaining to Plaintiff;
E. EON IPG programming data for Mrs. Trickett's devices;
F. ANS Non-Conformance data;
G. ANS test data relating to Plaintiff's explanted devices;
H. ANS EON Clinician's Manual;
I. Plaintiff's First Amended Complaint, dated April 16, 2007;
J. Deposition transcripts of Plaintiff, Edward Palmer, Paul Dawson, Eileen St. Aubin, Lee Edeker and Dan Srader;
K. Plaintiff's Handwritten diary/log of alleged symptoms.

Based on my review of this information, my experience in the fields of neurosurgery and neurostimulation, and my professional experiences with spinal cord stimulators, to include the ANS EON IPG, I offer the following opinions:

The science of neurostimulation involves an intricate interaction of an external electric force placed on the central nervous system of the human body. The placement of the electrical force strongly influences the extent and scope of the current, and the individual perception of the patient further influences the level of stimulation received.

Many factors can affect the electrical field at the electrode/nervous tissue interface and therefore the quality and the intensity of the stimulation. Such factors include changes in impedance (related in most instances by the growth of scar tissue between the electrode and the intervening tissues), movement of the leads (lead migration), physiological changes related to normal movement of the nervous structures within the dural sac , and a host of other biological and physical reasons unrelated to the stimulator device itself. An increase in impedance requires a larger amount of voltage to be

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supplied to maintain the same level of current to the lead. This increase may result in a controlled increase of power output, which some may consider to feel like a "shock." The perception each patient may feel to this compensatory stimulation differs depending on the frequency of the program and the individual characteristics of the patient. Over the course of my thirty years of implanting patients with spinal cord stimulators, to include the EON IPG, the most common reason for an overstimulation or shocking relates to changes in position without the appropriate corrections to the stimulation amplitude by the patient. Based on the absence of a demonstrated malfunction of the device, the shocking/overstimulation symptom as described by Mrs. Trickett, are most likely caused either by an abnormal reaction of her nervous system to the stimulation, by a normal compensatory stimulation to increased impedance on the lead or an abnormal sensitivity to positional change. It is not likely at all that the overstimulation is the result of any malfunction with the stimulator as such a malfunction would be reproducible in the type of bench testing performed by ANS following each explant.

I am very familiar with the ANS EON IPG and have implanted and explanted a number of these devices in patients over the past few years. Each patient displays a unique interaction with a spinal cord stimulator such as the EON IPG. These idiosyncratic tendencies found in spinal cord stimulator recipients are common and do not necessarily always imply that the implanted device malfunctioned or contains any product defect. It is often not possible to predict how the device will interact with the patient, particularly when the patient has chronic pain condition, until after the device is implanted and is being used by the patient.

Patients with chronic incurable conditions of the nervous system often undergo a rearrangement of some of the functioning of their nervous system. Often times the manner in which the nervous system behaves when subjected to a variety of conditions is completely unpredictable and might not be explainable. This is very true in patients inflicted by chronic pain conditions such as Mrs. Trickett. She has been diagnosed with, among other things, RSD, fybromyalgia, Restless Leg Syndrome and Chronic Pain Syndrome. Her complex combination of disorders makes her nervous system particularly vulnerable to unpredictable reactions to stimulation.

A certain percentage of patients implanted with spinal cord stimulator devices will experience neurological problems that are solely related to a dysfunction of the nervous system and not of the implanted device. Sometimes the precise cause of the dysfunction in the nervous system cannot be isolated, as appears to be the situation with Mrs. Trickett.

I am aware of numerous situations where spinal cord stimulator recipients, like Mrs. Trickett, have experienced similar symptoms as Mrs. Trickett complains of, but which are clearly related to the idiosyncratic condition of the patient. For example, a patient with cerebral palsy was implanted by me with a high cervical spinal cord stimulator. The type of stimulator was a Neuromed radiofrequency system. A few weeks after the implant the patient started to experience severe jolts affecting all 4 extremities and occurring about 5-6 times/week. The jolts were felt as a sudden surge in the stimulation. The system was checked and no abnormalities were found. The pulse generator was eventually replaced with a second one. The same problem continued. Eventually it was concluded to a reasonable degree of medical certainty, that the patient's nervous system was more likely than not the cause of the reaction. The stimulator was removed and the patient was deemed

not to be a candidate for neurostimulation. This determination followed an initial successful trial period with the stimulator.

Another example involves a patient whom I implanted with a Advanced Bionics spinal cord stimulator. The patient started to experience severe uncontrollable jerky contractions of the lower extremities following implantation of a spinal cord stimulator in the cervical spine. The contractions were not present during the temporary test trial, but started one week after the implant. No malfunction of the implant could be determined, nor any undue pressure on the spinal cord by the electrodes. Eventually the stimulator had to be removed. The contractions stopped immediately when the stimulator was removed.

Finally, in another case a patient complained of a severe increase in the intensity of the stimulation when going from the lying to the standing position. This is exactly the opposite from what normally happens, since, in the lying position, gravity brings the nerves closer to the electrodes. No corrective measures were effective and eventually the patient had to stop using the stimulator. The device contained no malfunction or defect. Once again, I was able to determine within a reasonable degree of medical certainty that the most likely cause of the symptoms was the patient's idiosyncratic reaction to the device and not any malfunction within the device. It should be noted that positional changes can greatly impact the amount of voltage supplied to the spinal cord by a spinal cord stimulator.

There are numerous other cases involving both the EON IPG, as well as other spinal cord stimulators, where unusual reactions of the nervous system following implant of a spinal cord stimulator eventually lead to its removal. The conclusion is that often unexplained neurological reactions occur due to a function of the nervous system and not necessarily of the implanted device. The instances I refer to did not involve any defect or malfunction of the spinal cord stimulator. This statement applies to spinal cord stimulators across the board and includes the EON IPG implanted in Mrs. Trickett.

Based on Mrs. Trickett's medical records, there was also evidence of a lead migration. Lead migration is a relatively common occurrence and often results from excessive physical activity or movement by the patient. Unpleasant sensations, such as feelings of "jolting," have been experienced by patients with lead migration.

Mrs. Trickett asserts a "shocking" sensation occurred at various times and with 2 separate devices. The occurrence of the same symptoms after a revision is a strong indication that Mrs. Trickett's complaints are caused by the idiosyncratic makeup of her nervous system and not a malfunction or defect in the EON IPG. I have never seen a situation (in about 6,000 implanted cases performed by me over the past 30 years) where more than one implanted IPG created exactly the same problem as a previously explanted device without it being determined that it was more probably than not brought about by the patient's nervous system. The possibility that more than one IPG implanted within Mrs. Trickett would be affected by a similar malfunction is statistically negligible and therefore highly unlikely to a reasonable degree of medical certainty. This opinion is further supported by the tests performed by ANS personnel and Mr. Edward Palmer.

Mrs. Trickett also asserted that her devices create an "off/on" sensation that she describes as being temporal in nature, that is, that it occurred on a regular interval. I have never received such a complaint by any of my patients, nor am I aware that such a symptom is consistent with a defect or malfunction of the device.

Moreover, Mr. Edward Palmer's supplemental report indicates that a "malfunction" relating to the device turning itself off and on "could be related to the integrity of the lead wires explanted from Sandra Kay Trickett." As a basis for this opinion, Mr. Palmer asserts that his testing revealed that if the impedance between any of the lead contacts was too high, the device would turn itself off after approximately five seconds. He also stated that he had to manually turn the device on again once it turned itself off following the increase in the impedance level. Mr. Palmer's deposition testimony reveals that he could not determine that this function of the device was a malfunction or defect. I concur with that conclusion as the device is designed to shutdown when the impedance exceeds certain program parameters. The fact that the device turns itself off at certain impedance levels is neither unexpected nor is it indicative of a malfunction of the device or the leads.

I am also familiar with laboratory testing of spinal cord stimulators (even though I have never personally performed one) having reviewed such reports over the past 30 years. I reviewed the testing data prepared by ANS, which is the testing data corresponding to the two IPGs explanted from Mrs. Trickett. With respect to the electrical output, the test procedures used by ANS duplicate the condition the explanted devices are exposed to while implanted and are similar to those performed by other spinal cord manufacturers whom have tested explanted devices for my patients. Based on the ANS test results, the IPGs performed flawlessly and no malfunction could be detected. There was no dangerous outburst of current or other abnormality that could have been responsible for Mrs Trickett's symptomatology. Based on the method by which the testing was performed, I can conclude, to a reasonable degree of medical certainty, that the symptoms complained of by Mrs. Trickett could have been replicated during the ANS testing, if in fact the device was malfunctioning. The issue in question here is whether the IPG would periodically have surges of the current above the preset parameters. This is a malfunction that can be reliably tested in the lab.

The recharging time of the EON IPG can differ significantly between patients. Based on the placement of the recharging coil and the level of output selected by the patient, the time needed to recharge a battery can differ significantly. As a general rule, the higher the frequency of the program used by the patient, the more frequently the battery will need to be recharged. Numerous other factors, such as the duration the device is used and recharging technique, also influence the recharging time of the EON IPG. Based on the complaints made by Mrs. Trickett concerning the recharging of the device and her self-reported preference for high frequency stimulation, she experienced routine charging patterns and there is no conclusive evidence to support a finding that the device does not properly charge.

Based on the above considerations, and to a reasonable degree of medical certainty, it is not probable that Mrs Trickett's symptoms following the three different implants of the spinal cord stimulators can be attributable to any malfunction of the ANS EON pulse generator or the leads. I believe that this is an unfortunate situation where the patient's nervous system is not amenable to neurostimulation with an EON IPG.

Giancarlo Barolat, M.D.

8-16-2007

Encls.
1. Curriculum Vitae
2. List of publications and lectures

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Giancarlo Barolat M.D.

Curriculum Vitae

Brief Narrative

Dr. Barolat finished medical school in 1974 at the University of Torino, Italy. He then undertook a residency in Neurosurgery at the University of Torino. Subsequently, he undertook a fellowship inFunctional Neurosurgery and Neurostimulation at the Mount Sinai Medical Center in Miami, Florida. Following the fellowship, Dr. Barolat took a second residency in Neurosurgery at the Medical College of Wisconsin in Milwaukee. He is certified by both the American and the Italian Board of Neurosurgery.

Dr. Barolat was professor of Neurosurgery at Thomas Jefferson University, Director of Neurosurgical Services at Thomas Jefferson University Hospital (TJUH) and Director of the Division of Functional Neurosurgery at Thomas Jefferson University until December 2004 .

Dr. Barolat was-President of the International Neuromodulation Society and is on the Board of the American Neuromodulation Society and on the Editorial Board of the Journal, Neuromodulation. He is currently Director at large of the International Neuromodulation Society

Dr. Barolat practiced at Thomas Jefferson University Hospital from 1985 to 2004 . His practice has encompassed cranial and spinal surgery as well as functional neurosurgery. Dr. Barolat has had extensive involvement with the oncology department in the surgical management of cerebral and spinal metastasis, particularly malignant melanomas. Dr. Barolat also functioned as the main pediatric neurosurgeon at TJUH, operating primarily on newborn infants with hydrocephalus and/or spina bifida. Dr. Barolat has extensive experience with surgical spine procedures. Dr. Barolat was fellowship trained in spinal cord and spine injuries. He was an integral part of the TJUH Spinal Cord Injury Program for over ten years. As such, he has performed hundreds of complex spine operations. He has also been involved in the surgical management of intractable seizures through implantation of vagus nerve stimulator devices

Dr. Barolat was President of the International Neuromodulation Society and is on the Board of the American Neuromodulation Society and on the Editorial Board of the Journal, Neuromodulation. He is currently Director-at-large of the International Neuromodulation Society

Dr. Barolat is also one of the world leaders in the area of neuro-implantable technologies for the management of pain and motor disorders. Dr. Barolat is one of the pioneers of spinal cord stimulation for spasticity and pain management. His practice is one of the largest in the country, with patients being referred from all over the United States.

Dr. Barolat has been the author of over 60 medical articles and book chapters. He has lectured extensively nationally and internationally.

Dr Barolat is currently practicing neurosurgery and neuromodulation in Denver, Colorado, and is affiliated with Skyridge Medical Center. He is the CEO and Director of the Barolat Institute.

Giancarlo Barolat, M.D.

Residence

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Golden,CO 80401

Business Address

10099 RidgeGate Parkway, Suite 480

Lone Tree, Colorado 80124

Born: Torino, Italy *April 15, 1950*

Citizenship *USA, Italy*

Education

M.D. - Medicine *July 1968-June 1974*

University of Torino Medical School
Torino, Italy

Resident In Neurosurgery *July 1974-June 1978*

University of Torino
Torino, Italy

Intern *July 1979-June 1980*

Medical College of Wisconsin
Milwaukee, Wisconsin

Resident In Neurosurgery *July 1980-June 1985*

Medical College of Wisconsin
Milwaukee, Wisconsin

Fellowships

Fellowship — *July 1978-June 1979*

Neurostimulation Surgery
Mt. Sinai Medical Center
Miami, Florida

Fellowship — *July 1983-June 1985*

Spinal Cord Injury
VA Medical Center
Milwaukee, Wisconsin

Academic Positions

Department of Neurosurgery
Thomas Jefferson University
Philadelphia, PA:

Director
Division of Functional Neurosurgery — *February 1991-12/31/04*

Professor — *July 1st 1993-12/31/04*

Associate Professor — *July 1988-October 1993*

Assistant Professor — *July 1985-June 1988*

Current Position

CEO and Director — *Barolat Institute*

Board Certifications

Italian Board of Neurosurgery — *July 1979*

American Board of Neurosurgery — *September 1987*

Medical License

Colorado *MD-43166*

Pennsylvania *MD-033678-E*

Membership in Professional Societies

- *American Neuromodulation Society*
- *American Academy of Pain Medicine*
- *American Association of Neurological Surgeons*
- *American Medical Association*
- *American Pain Society*
- *American Paraplegia Society*
- *American Spinal Injury Association*
- *Congress of Neurosurgeons*
- *European Society for Stereotactic and Functional Neurosurgery*
- *Greater Philadelphia Pain Society*
- *International Association for the Study of Pain*
- *Italian Neurosurgical Society*
- *International Neuromodulation Society*
- *Pennsylvania Medical Society*
- *Philadelphia County Medical Society*
- *World Society for Stereotactic and Functional Neurosurgery*

1991-1993	Executive Board Member:	Philadelphia Pain Society
1993-1997	Executive Board Member:	Greater Philadelphia Pain Society
1994--2000	President, International Neuromodulation Society	
1994-present	Founding Member and Co-Director, American Neuromodulation Society	
1994-present	Member of the Executive Council, Joint Pain Section of the Congress of Neurological Surgeons and the American Association of Neurological Surgeons	

Activities at Thomas Jefferson University Hospital

1986 to2004	Director Neuro-Implant Program
1991 to 2004t	Director, Division of Functional Neurosurgery
1994 to 2004	Member, Professorial Committee

Technical contributions to neurostimulation development

Designed the following electrodes for spinal cord stimulation:

Resume TL	Medtronic Inc.	(commercially available product)
Symmix	Medtronic Inc.	(commercially available product)
Dual Symmix	Medtronic Inc.	(custom product)
Baritrode	Neuromed Inc.	(custom product)

1996 to Present

Editorial Board, Journal of Neuromodulation

Publications

Publications

1. Galimberti, J, Barolat-Romana, G.: Considerazioni su un caso clinico di trombose venosa cerebrale subacute post-cranio-traumatica. L'Ospedale Maggiore Di Novara 6:1.6. 1974.

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3. Barolat G.: Assessment of Motor Disorders. In R.Davis,G. Kondraske, W. Tourtellotte, K. Syndulko Editors: Quantifying Neurologic Performance. State of the Art Reviews: Physical Medicine and Rehabilitation, Vol 3/No 2,pp 111-128, 1989

4. Barolat G.: Current status of epidural spinal cord stimulation. Neurosurgery Quarterly,5, 98-124, 1995

5. Barolat G. Mapping of sensory responses to epidural spinal cord stimulation. In Horsch S, Claeys L Eds. Spinal Cord Stimulation II, Springer 1995,223-234

6. Barolat G.: Spinal cord stimulation for chronic pain management. In Gildenberg Tasker Eds. Textbook of Stereotactic and Functional Neurosurgery. McGraw Hill, 1519-1537, 1997

7. Barolat G., Peacock W., Staudt L.: Pain and spasticity. In Benzel E. Ed. Spine Surgery: Techniques, Complications Avoidance and Management. Churchill Livingstone, 1999, 863-876

8. Barolat G., North R. Spinal cord stimulation: implantation techniques. pp 535-548 In Burchiel Ed. Textbook of Pain Surgery. Thieme Medical Publisher, New York, 2002

11. Barolat G: Spinal cord stimulation for chronic pain management. Archives of Medical Research, 31,258-261, 2000

12. Barolat G: , Sharan A:: Spinal cord stimulation for back pain. In Simpson Ed. Electrical Stimulation and the Relief of Pain. Pain Research and Clinical Management. Vol.15. Elsevier Science. Amsterdam, The Netherlands 2003, pp 79-86

13. Barolat G: , Sharan A:: Spinal Cord Stimulation for Chronic Pain Management . In Pain Management for the Neurosurgeon: Part 2; Editor in Chief, Winfield S. Fisher III, M.D.; Guest Editor, Kim J. Burchiel, M.D., F.A.C.S. Seminars in Neurosurgery, volume 15, number 2, 2004

Lectures

Invited Lectures: International

1. Neurosurgery for Movement Disorders. Presented at the Tianjin Medical Association Meeting. Tianjin, **China**, November 7, 1985.

2. Surgical Management of Spasticity. Presented at the Beijing Friendship Hospital, Beijing, **China**, November 9, 1985.

3. Spinal Cord Stimulation in the management of Intractable Spasticity in Spinal Cord Injured. 4th Annual Spinal Cord Injury Research Symposium. Canadian Paraplegic Association. Toronto, **Canada** ,Oct 13-14,1988

4. Spinal Cord Stimulation for Pain management. Canadian Pain Society and American Pain Society Joint Meeting. Toronto **Canada** ,Nov 10-13,1988

5. Chronic intrathecal morphine infusion for intractable pain in Reflex Sympathetic Dystrophy. Canadian Pain Society and American Pain Society Joint Meeting. Toronto **Canada,** Nov 10-13,1988

6. Mapping of Sensory Responses to Epidural Spinal Cord Stimulation. International Meeting on Epidural Stimulation and Infusion Systems. Tenerife, **Spain**, May 23-25,1991.

7. Spinal cord stimulation: Radiofrequency vs. totally implantable systems. 7th World Congress on Pain. Paris, **France**, August 22-27,1993

8. Mapping of Sensory Responses to Epidural Spinal Cord Stimulation. International Meeting on Epidural Stimulation and Infusion Systems. 7th World Congress on Pain. Paris, **France** August 22-27,1993

9. Pain and spasticity in spinal cord injury. X Meeting of the World Federation of Neurosurgical Societies, Acapulco, **Mexico**, Oct 16-22 1993

10. Mapping of spinal cord stimulation responses. Moderne Metodiche di Trattamento del Dolore Cronico (Modern Methodologies in Chronic Pain Treatment). Padova, **Italy**, Nov. 27,1993

11. Outcome of spinal cord stimulation in chronic pain management. 3rd National Meeting of the Italian Society of Pain Clinicians, Rome, **Italy**, Dec 2-3,1993

12. Stimulation produced paresthesiae in spinal cord stimulation. 2nd congress of the International Neuromodulation Society. Goteborg, **Sweden**,, June 1-4 1994

13. Spinal cord stimulation in spasticity. 2nd congress of the International Neuromodulation Society. Goteborg, **Sweden**, June 1-4 1994

14. Spinal cord stimulation for management of chronic pain. Recents concepts in the management of chronic pain. Saint Savas Hospital, Athens, **Greece**. 6,6,1994

15. Mapping of sensory responses to epidural spinal cord stimulation. International Symposium on Spinal Cord Stimulation for Peripheral Vascular Disease. Cologne , **Germany**, Oct. 29,1994

16. What structures are being stimulated in spinal cord stimulation. Meeting of the Vienna Working Group on Neurostimulation, Vienna General Hospital, Vienna, **Austria** Feb. 2,1996

17. Vagus nerve stimulation for epilepsy: Surgical Technique. XV Yugoslavian Symposium of Epileptology. Belgrade, **Yugoslavia,** June 5-9,1996

18. Spinal Cord stimulation Systems: an Update. International Seminar on Pain Therapy. Universita. Cattolica, Rome **Italy** Sept. 27,1996

19. Spinal Cord Stimulation in America: Indications, Outcomes, Reimbursements. The 7th International Symposium: The Pain Clinic, Istanbul, **Turkey**, Oct. 3,1996

20. Strategies for Spinal Cord Stimulation. XIIth Meeting of the World Society for Stereotactic and Functional Neurosurgery. Lyon, **France** July 1-4,1997

21. Neuromodulation of the spinal cord for motor disorders. 11th International Congress of Neurological Surgery. Amsterdam, **The Netherlands,** July 6-11, 1997

22. Ablation of the nervous system: chemical vs thermal vs surgical. 1st Course on Interventional Techniques in Pain Management. Valladolid, **Spain** September 16-19,1997

23. Neurophysiology of spinal cord stimulation. 1st Course on Interventional Techniques in Pain Management. Valladolid, **Spain** September 16-19,1997

24. Indications for spinal cord stimulation for chronic pain. 1st Course on Interventional Techniques in Pain Management. Valladolid, **Spain** September 16-19,1997

25. Strategies for spinal cord stimulation. 8th World Congress. The Pain Clinic. Tenerife, **Spain**, May 6-10,1998

26. Spinal cord stimulation for reflex sympathetic dystrophy. 8th World Congress. The Pain Clinic. Tenerife, **Spain**, May 6-10,1998

27. History of Neuromodulation. 4th International Congress of the International Neuromodulation Society, Lucerne, **Switzerland**, Sept. 16-20, 1998

28. Spinal cord stimulation for the failed back syndrome. . 4th International Congress of the International Neuromodulation Society, Lucerne, **Switzerland**, Sept. 16-20, 1998

29. Spinal cord stimulation and the failed back syndrome. Incontro Multidisciplinare sulla Terapia del Dolore. Como. **Italy** Nov. 26-28,1998

30. Stategies in the management of radicular pain. Incontro Multidisciplinare sulla Terapia del Dolore. Meeting of the Italian Society of Pain Clinicians. Como. **Italy** Nov. 26-28,1998

31. Spinal Cord Stimulation In Chronic Pain Management. 1st International Symposium in Latin America On Neuromodulation of the intractable neurological symptoms. Cancun, **Mexico**, July 24-25,1999

32. Intrathecal baclofen for spasticity. La spasticita': Attuali opzioni terapeutiche. Convegno Nazionale di Riabilitazione Neurologica. Alba, **Italy**, March 31-April 1st, 2000

33. Spinal Cord Stimulation for Low Back Pain. Symposium on the application of advanced technologies in complex pain syndromes. Sydney, **Australia** March 23,2002

34. Electrical Stimulation of the cervical spinal cord. Symposium on the application of advanced technologies in complex pain syndromes. Sydney, **Australia** March 23,2002

35. Intrathecal Bclofen for Pain and Spastiicty. 10th International Pain Clinic – World Society of Pain Clinicians. Sardinia, **Italy** May 4-8th, 2002

36. Neuropathic Pain. The Surgeon's Perspective. 10th International Pain Clinic – World Society of Pain Clinicians. Sardinia, **Italy** May 4-8th, 2002

37. Spinal Cord Stimulation For Back Pain. 10th International Pain Clinic – World Society of Pain Clinicians. Sardinia, **Italy** May 4-8th, 2002

38. Spinal Cord Stimulation for Angina. 10th International Pain Clinic – World Society of Pain Clinicians. Sardinia, **Italy** May 4-8th, 2002

39. Spinal Cord Stimulation for Peripheral Vascular Disease. 10th International Pain Clinic – World Society of Pain Clinicians. Sardinia, **Italy** May 4-8th, 2002

40. The Psychological Evaluation of Candidates for Neuro-Implant Procedures. 10th International Pain Clinic – World Society of Pain Clinicians. Sardinia, **Italy** May 4-8th, 2002

41. Spinal Cord Stimulation For Back Pain. Interactive Spinal Cord Stimulation Symposium. St Thomas Hospital. London, **England**. May 10,2002

42. Strategies for Cervical Spinal Cord Stimulation.. 1st Simposio Romano sulla Neuromodulazione. Rome, **Italy**, Dec 13,14,2002

43. . Spinal Cord Stimulation for Reflex Sympathetic Dystrophy. Management of the Chronic Pain Patient: a Hands-On Cadaver Workshop for the Experienced User. Brussels, **Belgium** Jan31-Feb1, 2003

44. . Subcutaneous Peripheral Nerve Stimulation. Management of the Chronic Pain Patient: a Hands-On Cadaver Workshop for the Experienced User. Brussels, **Belgium** Jan31-Feb1, 2003

45. Future of Neuromodulation. Combined Meeting of the Australian Pain Society and New Zealand Pain Society. Cristchurch, **New Zealand**, March 9-13, 2003

46. Subcutaneous Peripheral Stimulation. 25th Meeting of the Associazione Italiana Per Lo Studio Del Dolore. Venice, **Italy**, May 11, 2003

47. Spinal Cord Stimulation for the Failed Back Syndrome. 25th Meeting of the Associazione Italiana Per Lo Studio Del Dolore. Venice, **Italy**, May 11, 2003

48. Past, Present and Future of Spinal Cord Stimulation. 6th International Neuromodulation Society World Congress.. Madrid, **Spain.** June 26, 2003

49. Cervical spinal cord stimulation. 2nd International Meeting on Pain Therapy. Pescara, **Italy** Sept 17-19,2003

50. Current status of neuromodulation in the USA. Meeting Internazionale. Controversie in Neuromodulazione, Terapia Antalgica e Cure Palliative. Arezzo, **Italy** Oct 10,2003

51. Subcutaneous stimulation for chronic pain management. Il Controllo del Dolore:Dai Farmaci alle Tecniche Mini-Invasive. Genova, **Italy**, March 28,2004

52. An update on neurostimulation. 3rd World Congress of the World Institute of Pain. Barcelona, **Spain**, Sept 20,2004

53. The evolution of Neuromodulation for chronic pain management. 3rd World Congress of the World Institute of Pain. Barcelona, **Spain**, Sept 23,2004

54. Neuromodulation in lumbar spine problems. XIV Congresso Nazionale Societa' Italiana Clinici del Dolore. Ancona, **Italy** Oct 1,2004

55. Overview of surgical management of pain. 11th Meeting of the Hong Kong Neurosurgical Society, Hong Kong, **China**, Dec 3-4, 2004

56. Neurostimulation for chronic pain. 11th Meeting of the Hong Kong Neurosurgical Society, Hong Kong, **China**, Dec 3-4, 2004

57. Contemporary equipment for spinal cord stimulation . 11th Meeting of the Hong Kong Neurosurgical Society, Hong Kong, **China**, Dec 3-4, 2004.

58. Advances in Neurostimulation. Course on Advanced Neuromodulation technologies. Rome , **Italy**, June 10,2005

59. Stimulation of the Peripheral Nervous Syatem. Meeting of the International Neuromodulotian Society. Rome, **Italy**, June 11, 2005

60. Neuromodulation for the failed back syndrome. Panpacific symposium on electrical stimulation. Sydney, **Australia**, August 20,2005

61. Spine surgery indications. . Il Dolore Rachideo. Taranto, **Italy**, Sep 23, 2005

62. Neurostimulation for the failed back syndrome. . Il Dolore Rachideo. Taranto, **Italy**, Sep 23, 2005

63. Overview of neurostimulation. Invitational Conference. New and innovative Developments in Electrical Spinal Cord Stimulation –Amsterdam, **The Netherlands**, April 7, 2006

64. Stimulation of the Peripheral Nervous System for chronic Pain . 12th Congress of the World Society of Pain Clinicians, Torino, **Italy**. July 4-7,2006

65. History of Neuromodulation. 12th Congress of the World Society of Pain Clinicians, Torino, **Italy**. July 4-7,2006

66. Overview of Neuromodulation. 12th Congress of the World Society of Pain Clinicians, Torino, **Italy**. July 4-7,2006

67. Strategies for Neurostimulation in for Chromic Pain Management. 12th Congress of the World Society of Pain Clinicians, Torino, **Italy**. July 4-7,2006

Invited Lectures: National

1. The dystonic hand. Issues in hand rehabilitation. Curative Rehabilitation Center. **Milwaukee**, Wis. January 30, 1985.

2. Spinal stimulation in spasticity management. Regional Physiatric Conference. **Chicago**, Ill. September 16, 1984.

3. Quantitative assessment of motor disorders in neurosurgery. Workshop on Assessment of Neurological Dysfunction. **Rockport**, Maine, July 21-22 1986.

4. Neurosurgical Management of Pain. 9th Annual Conference on Psychosomatic disorders. **Philadelphia**, PA, October 25, 1986.

5. Surgical Approaches to the Spine. Meeting of the American College of Surgeons. **San Francisco**, CA., October 11-16, 1987.

6. Surgical Management of Pain. Meeting of the American College of Surgeons. **San Francisco**, CA., October 11-16, 1987.

7. Reflex Sympathetic Dystrophy, Clinical Features and New Treatment Modalities. 40th Meeting of the American Academy of Neurology, **Cincinnati**, Ohio, April 17, 1988.

8. Epidural Spinal Cord Stimulation on Spinal Cord Injury Patients. Pathophysiology and Management of Spasticity in Spinal Cord Injury and Cerebral Palsy, University of Virginia, **Charlottesville**, VA, May 12527, 1988.

9. Chronic Pain Management. Common Problems in Neurology. Thomas Jefferson University, **Philadelphia**, Feb 23-25 1989.

10. Neurosurgical Management of Reflex Sympathetic Dystrophy. Reflex Sympathetic Dystrophy: Current Strategies in Diagnosis and Treatment. Thomas Jefferson University. **Philadelphia**, March 10, 1989.

11. Neurosurgical Management of Reflex Sympathetic Distrophy. 41 Annual Meeting of the American Academy of Neurology. **Chicago**,Ill. April 13-19, 1989.

12. Neurostimulation and Chronic Intrathecal Morphine Infusion for Chronic Pain. Symposium on Pain :Physiological and Pharmacological Mechanisms. Jefferson Medical College. **Philadelphia**, May 11,1989.

13. Selective Posterior Rhizotomy: The State of the Art. Contemporary Management of Cerebral Palsy: Surgical Options. Thomas Jefferson University, **Philadelphia**, May 24,1989.

14. Technical and methodological aspect of Spinal Cord Stimulation. Eastern Regional Medtronic Meeting. **Charlotte**, NC, August 22,1989.

15. Surgical Management of Reflex Sympathetic Dystrophy. Meeting on Reflex Sympathetic Dystrophy. **Denver**, CO, Sept 8, 1989.

16. The Morphine Pump in the Management of Reflex Sympathetic Dystrophy. Meeting of the American Pain Society. **St.Louis**, Missouri, Oct. 25,1990.

17. The Selective Rhizotomy: Indications, Short/Long Term Results. Course "The Spectrum of Developmental Disabilities XIII: Cerebral Palsy. Johns Hopkins Medical Institutions, **Baltimore**, MD, March,20,1991.

18. The Selective Rhizotomy in Cerebral Palsy. Pediatric Neurology for the 90's. A.I. Dupont Institute, **Wilmington**, De, May 17,1991.

19. Potential clinical research projects for spasticity. Future Research in neurological and functional recovery in spinal cord injury. Thomas Jefferson University, **Philadelphia**, Pa 2-28-1992

20. Neurosurgical management of spina bifida and its complications. The Child with Spina Bifida, 37th Annual Symposium of Children's Rehabilitation Hospital. **Philadelphia**, Pa,June 3rd, 1991.

21. Neurosurgical management of chronic pain. 2nd Meeting of the Philadelphia Pain Society. **Philadelphia**, Pa, Oct 21, 1992

22. Acute low back pain management. Headache and Pain Management Symposium. Good Samaritan Medical Center. **Palm Beach**, Fla. Nov. 12, 1992

23. Chronic low back pain management. Headache and Pain Management Symposium. Good Samaritan Medical Center. **Palm Beach**, Fla. Nov. 12, 1992

24. Neuromodulation of spasticity with spinal cord stimulation. Spasticity update. New Treatment Methods: Neuromodulation and Surgical Techniques. **Phoenix**, Az, March 26-27,1993

25. Ablative procedures in spasticity management in the adult. Spasticity update. New Treatment Methods: Neuromodulation and Surgical Techniques. **Phoenix**, Az, March 26-27,1993

26. Spinal cord stimulation in chronic pain. First Meeting of the Bucks County Anesthesia Society. **Lahaska**, Pa, May 16, 1993

27. Neurosurgical interventions in chronic pain management. 3rd annual meeting of the Philadelphia Pain Society. **Philadelphia**, Pa Oct 27, 1993

28. Spinal cord stimulation for pain management. Annual Meeting of the American Association of Neurological Surgeons, **San Diego**, Ca, April 9 1994

29. Spinal cord stimulation and intrathecal morphine pumps for reflex sympathetic dystrophy. Annual Meeting of the Western Pain Society, **Newport Beach**,Ca, April 15, 1994

30. Neurosurgical management of spasticity in cerebral palsy. New trends in the diagnosis and treatment of cerebral palsy. Children Rehabilitation Hospital, **Philadelphia**, PA, April 23,1994

31. Spinal cord stimulation, implantation techniques. Danamiller Memorial Educational Foundation . Workshop on Neuroimplantation Techniques. **Washington** DC, May 22-23, 1994

32. Spinal cord stimulation: indications, patient selection and techniques. Course in Pain Management Techniques.. 44th Annual Meeting of the Congress of Neurological Surgeons, **Chicago** ,IL,October 1-6,1994

33. Optimal position of epidural electrodes for spinal cord stimulation. Current concepts in chronic pain management. **Memphis**,TN, March 24-25, 1995

34. Complications of spinal cord stimulation. Current concepts in chronic pain management. **Memphis**,TN, March 24-25, 1995

35. Neurosurgery for motor disorders. Grand Rounds. Baptist Memorial Hospital, **Memphis**, TN, March 23,1995

35. Spinal cord stimulation: techniques and indications. Course on Neuroaugmentative Procedures for Pain Management. 45th Annual Meeting of the Congress of Neurological Surgeons, **San Francisco**, CA, October 14,1995

36. Treatment algorhytms for complex regional pain syndromes. Complex Regional Syndromes Workshop, **Malibu**, CA, Nov, 5-8,1995

37. What structures are being stimulated in spinal cord stimulation? 3rd Meeting of the International Neuromodulation Society and 1st Meeting of the American Neuromodulation Society. **Orlando**, Fla March 6-10, 1996

38. Spinal cord stimulation for motor disorders. 3rd Meeting of the International Neuromodulation Society and 1st Meeting of the American Neuromodulation Society. **Orlando**, Fla March 6-10, 1996

39. Multiple electrodes in spinal cord stimulation for pain management. Danamiller Symposium on "Interventional Techniques in Chronic Pain Management". **Memphis**, TN April 19-20, 1996

40. Spinal cord stimulation in chronic pain management. Course in " Neuromodulation techniques in chronic pain management" 62th Meeting of the American Association of Neurological Surgeons. **Minneapolis**, MN, April 30 1996

41. Complications of neuromodulation procedures in pain management. Interventional therapies in chronic pain management. **Denver**, CO , April 10-11,1997

42. Peripheral nerve stimulation. AANS Workshop on Neuromodulation Interventions for Pain Management, **Denver**, CO, April 12,1997

43. Overview of Neuromodulation. Second Scientific meeting of the American Neuromodulation Society. **Cleveland**, OH, May 16,1997

44. Neuromodulation. Advances in Pain Management. **Cleveland**, OH, May 17,1997

45. Spinal cord stimulation for chronic pain management. Meeting of the American Association of Operating Room Nurses. **Philadelphia**, Pa, Sept 27,1997

46. Spinal cord stimulation: techniques and outcomes. Course in Neuroimplantation Techniques in Pain Management. 46th Annual Meeting of the Congress of Neurological Surgeons. **New Orleans**, LA Sept 29,1997

47. Intrathecal baclofen for spasticity management. Advances in Restorative Neurology and Rehabilitation, Bryn Mawr Rehabilitation Center, **Malvern**, Pa, Nov. 7,1997

48. Spinal cord stimulation for brachial plexus stretch injuries. Symposium on the application of advanced technology in complex pain syndromes. **Dallas**, TX , Nov 21-22,1997

49. The failed back syndrome. Seminars in chronic pain management. Bryn Mawr Rehabilitation Center, **Malvern**, Pa, Nov 9,1997

50. Neuromodulation: advances and mechanisms. Current Concepts in Acute, Chronic and Cancer Pain Management. **New York**, NY, Dec 12,1997

51. Neuromodulation: current status and future advances. BT Alex Brown Medical Technology Conference. **Aspen,** CO, March 2nd, 1998

52. Spinal Cord Stimulation: Indications and Outcomes. Interventional Therapies in Neurosurgical Pain Management. Satellite Workshop. Annual Meeting of the American Association of Neurological Surgeons. **Philadelphia**, PA April 3,1998

53. Role of spinal cord stimulation and intrathecal drug infusion in the failed back syndrome. The Tenth Pan-Philadelphia Neurosurgery Conference, **Philadelphia**, PA Dec 4,1998

54. Spinal cord stimulation implantation techniques. Meeting of the American Academy of Pain Medicine, **Palm Springs**, CA, Feb 11,1999

55. Practical approach to the failed back patient. Practical Pain Medicine, **Orlando**, FLA, April 30-May 2, 1999

56. Spinal cord stimulation for peripheral vascular disease and angina. Luncheon Seminars. 49th Annual Meeting of the Congress of Neurological Surgeons. **Boston**, MA Nov 2,1999

57. Current concepts in neuromodulation and mechanisms of spinal cord stimulation. Current Concepts in acute, chronic and cancer pain management. The World Foundation for Pain Relief and Research. **New York**, NY, Dec 8-10, 1999

58. Vagus nerve stimulation for epilepsy: surgical technique. Cyberonucs Physician Symposium. **Philadelphia**, PA March 11,2000

59. How to optimize paresthesiae with spinal cord stimulation. Worldwide Pain Conference 2000,July 14-20, **San Francisco**, 2000

60. Psychological evaluation for neuroimplantable procedures. Worldwide Pain Conference 2000,July 14-20, **San Francisco**, 2000

61. Basic neurophysiology of spinal cord stimulation. Worldwide Pain Conference 2000,July 14-20, **San Francisco**, 2000

62. Clinical trials with spinal cord stimulation. Internet Solutions for Clinical Trials, **New York**, NY, Sept 20,2000

63. Spinal cord stimulation for angina and peripheral vascular disease. Congress of Neurological Surgeons, **San Antonio**, TX Sept 26,2000

64. Basic neurophysiology of neurostimulation. Advanced Pain Management. **Dallas**, TX, Nov. 18-19,2000

65. Intracranial targets for neurostimulation. Advanced Pain Management. **Dallas**, TX, Nov. 18-19,2000

66. Comprehensive Pain Management programs for neurosurgeons. The 12th Pan-Philadelphia Neurosurgery Conference. **Philadelphia**, PA Dec. 18,2000,
Neurostimulation techniques in pain management. University of Pennsylvania. Grand Rounds. **Philadelphia**, PA, March 1,2001

67. Results of a multicenter study for low back pain. 5th Meeting of the American Neuromodulation Society. **Orlando**, FLA , March 7-10,2001

68. Dual lead stimulation –"Method or Mania". 5th Meeting of the American Neuromodulation Society. **Orlando**, FLA, March 7-10,2001

69. Workshop in complex pain management. **Philadelphia**, PA, April 7, 2001.

70. Basic electrophysiology of spinal cord stimulation. Advanced Pain Management Workshop. **Dallas** TX July 28-29, 2001.

71. Targets for intracranial stimulation. Advanced Pain Management Workshop. **Dallas** TX July 28-29, 2001.

72. Symposium on the application of advanced technology on complex pain syndromes. **Memphis**, TN August 13-14, 2001.

73. Spinal cord stimulation for the failed back syndrome. Luncheon Seminar on Spinal Cord Stimulation: Indications and Applications. 51st Annual Meeting of the Congress of Neurological Surgeons. **San Diego**, CA, 9-29, 10-4, 2001.

74. Basic electrophysiology of spinal cord stimulation. Advanced Pain Management Workshop. **Dallas**, TX October 6-7, 2001.

75. Targets for intracranial stimulation. Advanced Pain Management Workshop. **Dallas**, TX October 6-7, 2001.

76. Spinal Cord Stimulation for the failed back syndrome. Advanced Spinal Techniques. University of Florida. **Gainesville**, Fla Jan 26-27,2002

77. Spinal Cord Stimulation for reflex sympathetic dystrophy. Advanced Spinal Techniques. University of Florida. **Gainesville**, Fla Jan 26-27,2002

78. Spinal Cord Stimulation. Indications,Techniques. Outcomes. Interventional Therapies in Neurosurgical Pain Management. American Association of Neurological Surgeons and Congress of Neurosurgeons Section on Pain Symposium , **Chicago**. IL 4-4-2002

79. Neuropathic pain case presentations. 11th Annual Meeting of the Greater Philadelphia Pain Society. **Philadelphia**, PA 4-13-2002

80. Spinal cord stimulation for angina pectoris. Meeting of the North American Neuromodulation society. **Orlando**, Fla May 25,2002

81. Spinal Cord Stimulation in Pain Management. Fourth Annual Pain Management Conference . University of Medicine and Dentistry of New Jersey, **Philadelphia**, PA, July 20,2002

82. Chronic pain management:the consultant corner. Luncheon Seminar. 52nd annual meeting of the Congress of Neurological Surgeons. Sept. 22,2002. **Philadelphia**, PA

83. Neurostimulation techniques in chronic pain management. Advanced Topics in Neuromodulation. **Colorado Springs**, CO, 10-19-2002

84. Electrical stimulation of the nervous system in man.Advanced Topics in Neuromodulation. **Colorado Springs**, CO, 10-19-2002

85. Neurostimulation techniques for pain management. Pain Matters 2002 Symposium. **Orlando**, Fla 11-9-2002

86. Basic Neurophysiology of Spinal Cord Stimulation. Meeting of the American Academy of Pain Medicine. **New Orleans**, LA, Feb 20,2003

87. Neuromodulation of the spinal cord for motor disorders. Symposium on Evaluation and Management of Muscle Overactivity and Joint Contractures in Persons with UMN Syndrome. **Philadelphia**, PA 3-18-2003

88. Spinal cord stimulation for chronic pain management. Fifth Annual Pain Management Conference, **Philadelphia**, Pa, June 8th, 2003

89. Basic neurophysiology of spinal cord stimulation. Course on Advanced Therapies in Pain Management. **Memphis**, TN, Nov 14-15, 2003

90. Spinal Cord Stimulation. Postoperative follow-up. Course on Advanced Therapies in Pain Management. **Memphis**, TN, Nov 14-15, 2003

91. Multidisciplinary Pain Management. PanPhiladelphia Neurosurgical Meeting. **Philadelphia**, PA Dec 4,2003

92. The future of neuroscience: Implantable neuropacemakers. Wharton Conference on Emergent Technologies. Wharton Business School., **Philadelphia**, PA, Feb 6,2004

93. Basic neurophysiology of neurostimulation. Advanced Neuromodulation Systems National Sales Meeting. **Tucson**, AZ, Feb 7,2004

94. High cervical and motor cortex stimulation. 20th Annual Meeting of the American Association of Pain Management. **Orlando**, Fla, March 5,2004

95. Implantable devices for pain management. 12th Annual Meeting of the Greater Philadelphia Pain Society. **Philadelphia**, PA, April 17,2004 Neurostimulation for the failed back syndrome. Symposium on Advanced Neuromodulation Techniques. **Miami**, Fla, April 25,2004

96. Stimulation for Peripheral Neuropaties. North American Neuromodulation Society. 8th Annual Meeting. **Orlando**, Fla April 28-May 1st, 2004

97. Electrical Stimulation Science: Electricity and Anatomy. North American Neuromodulation Society. 8th Annual Meeting. **Orlando**, Fla April 28-May 1st, 2004

98. Neurostimulation:Basic Anatomy and Physiology. Meeting of the Colorado Pain Society. **Denver**, Co, June 11,2004

99. Pain management on the horizon. 6th Annual Pain Management Conference. **Philadelphia**, PA June 25,2004

100. Neurostimulation for pain management. Advanced Neuromodulation Symposium. **San Francisco**, CA. July 24,2004

101. Complications of Soinal Cord Stimulation. 21st Annual Meeting of the American Academy of Pain Management. **Palm Springs**, CA.. Feb 23-27,2005

102. Neurostimulation for difficult and complex cases. 21st Annual Meeting of the American Academy of Pain Management. **Palm Springs**, CA.. Feb 23-27,2005

103. Spinal cord stimulation for peripheral vascular disease and angina. 2005 Annual Meeting of the American Association of Neurological Surgeons. New Orleans, **LO** April 16-21,2005

104. Basic neurophysiology of spinal cord stimulation. Course on Advanced Therapies in Pain Management. **Memphis,** TN, April30-May 1st, 2005

105. Spinal Cord Stimulation. Postoperative follow-up. Course on Advanced Therapies in Pain Management. **Memphis,** TN, April30-May 1st, 2005

106. Neurostimulation for complex regional pain syndromes. Advanced Neuromodulation Symposium, **San Francisco**, CA, May 21-22,2005

107. Approaches to pain management. Manage Chronic Pain to Drive High Efficacy Rates and Increase Productivity. **Atlanta**, GA, Sept 26, 2005

108. Basic neurophysiology of spinal cord stimulation. Course on Advanced Therapies in Pain Management. **Memphis,** TN, Oct 21-22, 2005

109. Spinal Cord Stimulation. Postoperative follow-up. Course on Advanced Therapies in Pain Management. **Memphis,** TN, Oct 21-22, 2005

110. Management of Complex Regional Pain Syndromes. 22nd Annual Meeting of the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves. **Orlando**, FL, 3-17-2006

111. Neurostimulation in a neurosurgical practice. AANS / C N S Section on Pain. Satellite Symposium. **San Francisco**, CA April 21,2006

112. How to build successful pain private practice. AANS / C N S Section on Pain. Satellite Symposium. **San Francisco**, CA April 21,2006

113. Round table on Spinal Cord stimulation. 8th Annual meeting of the American Society of Interverventional Pain Physicians. **Arlington**, VA June 24,2006

Presentations- International

1. Clinical aspects and prognosis of traumatic coma in infancy and childhood. Meeting of the Italian Neurosurgical Society. Milan, **Italy**. May 20-22, 1976.

2. Aspects of the surgical treatment of spasticity. Meeting of the Italian Society of Pathology of the Locomotor System. Stresa, **Italy**. June 10-11, 1977.

3. New aspects in the surgical management of spasticity. Meeting of the European Society for Stereotactic and Functional Neurosurgery. Freiburg, **Germany**. September 19-21, 1977

4. Immediate effects of spinal cord stimulation on spinal spasticity. 7th Meeting of the European Society for Stereotactic and Functional Neurosurgery. Birmingham, **England**, June 5-7 1986

5. Epidural spinal cord stimulation in the management of reflex sympathetic dystrophy. Meeting of the American Society for Stereotactic and Functional Neurosurgery. Montreal, **Canada**, June 3-6, 1987.

6. Spinal Cord Stimulation in the Management of Pain due to Reflex Sympathetic Dystrophy. 5th World Congress on Pain, Hamburg, **Germany**, Aug 2-7, 1987.

7. Chronic Intrathecal Morphine Infusion for Intractable Pain in Reflex Sympathetic Dystrophy. 8th Meeting of the European Society for Stereotactic and Functional Neurosurgery, Budapest, **Hungary**, June 1-3, 1988.

8. Patterns of Epidural Spinal Cord Stimulation in Pain. Effects of Changing the Electrodes Polarity. 8th Meeting of the European Society for Stereotactic and Functional Neurosurgery, Budapest, **Hungary**, June 1-3, 1988.

9. A Multi-Center Randomized Crossover Study of the Use of Spinal Cord Stimulation for the Treatment of Spinal Cord Injury Spasms. Biostim '88, **Monaco**, June 15-18, 1988.

10. Epidural Stimulation of the Spinal Cord:Computerized Analysis of 1300 combinations. Part 1:Thoracic Cord. International Congress on Epidural Spinal Cord Stimulation. Gronigen, **The Netherlands** ,June 1-3,1989

11. Epidural Stimulation of the Spinal Cord:Computerized Analysis of 1300 combinations. Part 2:Cervical Cord. International Congress on Epidural Spinal Cord Stimulation. , Gronigen, **The Netherlands** June 1-3,1989

12. A scoring system for the analysis of electrode combinations in spinal cord stimulation. International Congress on Epidural Spinal Cord Stimulation. Gronigen, **The Netherlands** June 1-3,1989

13. A computerized database for spinal cord stimulation. International Congress on Epidural Spinal Cord Stimulation. Gronigen, **The Netherlands.** June 1-3,1989

14. Epidural Stimulation of the Spinal Cord:Computerized Analysis of 1300 combinations. 9th Congress of the European Society for Steretotactic and Functiona Neurosurgery. Marbella, **Spain**, Sept 16-20,1990.

15. Percutaneous presacral retroperitoneal lumbo-sacral plexus stimulation .9th Congress of the European Society for Steretotactic and Functiona Neurosurgery. Marbella, **Spain**, Sept 16-20,1990.

16. Epidural spinal cord stimulation for spasticity management in spinal cord injury: a prospective study. First Meeting of the International Neuromodulation Society. Rome, **Italy**, May 3-6, 1992

17. Mapping of responses to epidural spinal cord stimulation. First Meeting of the International Neuromodulation Society. Rome, **Italy,** May 3-6, 1992

18. Epidural spinal cord stimulation: computerized analysis of 4,000 combinations. First Meeting of the International Neuromodulation Society. Rome, **Italy**, May 3-6, 1992

19. Epidural spinal cord stimulation in reflex sympathetic dystrophy: experience with 100 implanted cases. First Meeting of the International Neuromodulation Society. Rome, **Italy**,May 3-6, 1992

20. Reliability of spinal cord stimulation devices: multicenter assessment. 7th World Congress on Pain. Paris, **France**, August 22-27,1993

21. Spinal cord stimulation for spasms in spinal cord injury: a prospective study. XI Meeting of the World Society for Stereotactic and Functional Neurosurgery. Ixtapa, **Mexico** Oct 9-15.1993

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3. Spinal cord stimulation for spasms secondary to spinal cord injury. 38th Annual Conference on Engineering in Medicine and Biology. **Chicago**, Ill. November 1, 1985.

4. Effects of spinal cord stimulation on spinal spasticity. 46th Meeting of the American Academy of Physical Medicine and Rehabilitation. **Kansas City**, MO. November 2, 1985

5. Effects of Spinal Cord Stimulation on Spasticity and Spasms Secondary to Myelopathy. Presented to the American Association of Neurological Surgeons Meeting, **Denver**, Colorado, April 16, 1986.

6. Effects of Spinal Cord Stimulation on Spasticity. Presented to the 1986 ASIA Meeting , **San Francisco**, California, March 13-15, 1986.

7. Spinal cord stimulation for spasticity: early experimental results. 2nd Annual Meeting of the Joint Section on Spinal Disorders AANS/CNS, **San Diego**, CA February 19-22, 1986

8. Progressive leukoencephalopathy in the posterior fossa of patients with AIDS. 38th Annual Meeting of the American Academy of Neurology. **New Orleans**, LA, April 27 - May 3, 1986

9. Early fatalities from spinal cord injury. Cervical Spine Research Society Meeting. Powell, J.S., Northrup, B.E., Barolat, G., **Palm Beach**, Fl, Dec 8-13, 1986.

10. Experience with Spasticity Analysis. Special Conference on Assessment of Motor Disability. **Memphis**, TN, Feb 14, 1987.

11. Neurosurgical Management of Advanced Reflex Sympathetic Dystrophy. Meeting on Reflex Sympathetic Dystrophy and Thermography. **Chicago**,ILL, June 18,1988.

12. The role of Epidural Spinal Cord Stimulation and of the Morphine Pump in the management of RSD. 8th Annual Meeting of the American Pain Society. **Phoenix**, AZ October 26-29,1989

13. How to optimize Spinal Cord Stimulation for Pain Management. An analysis of 1,000 combinations. 8th Annual Meeting of the American Pain Society. .**Phoenix**, AZ October 26-29,1989.

14. Epidural Spinal Cord Stimulation in the management of spasms and spasticity in Spinal Cord Injuries. First International Congress of Movement Disorders. **Washington** ,D.C. April 25-27,1990

15. The Selective Rhizotomy in the management of Cerebral Palsy. Meeting of the American Academy of Cerebral Palsy and Developmental Medicine. **Wilmington**, DE, 5-4-90.

16. Epidural Spinal Cord Stimulation in the Management of Spasms and Spasticity in Spinal Cord Injuries. Congress of Neurological Surgeons. **Los Angeles**, Oct.21-27,1990

17. Epidural Spinal Cord Stimulation for reflex Sympathetic Dystrophy. Spinal Stimulation:Clinical Applications in Chronic Pain and Technical Methods of the 1990's. **Denver**, Co. Sept. 27-28,1991

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21. The Selective Dorsal Rhizotomy through a limited exposure of the cauda equina at L1.Congress of Neurosurgery, **Orlando**, Fla ,Oct 27-30,1991

22. Mapping of sensory responses to spinal cord stimulation. 10th Annual Meeting of the American Pain Society, **New Orleans**, LA, Nov 8-10,1991

23. Spinal cord stimulation in the management of reflex sympathetic dystrophy. Meeting of the American Pain Society, New Orleans, LA, Nov 8-10,1991

24. Long term outcome of spinal cord stimulation in chronic pain management. 44th Annual Meeting of the Congress of Neurological Surgeons, **Chicago** October 1-6,1994

25. Geometry of intraspinal structures in spinal cord stimulation. 44th Annual Meeting of the Congress of Neurological Surgeons, **Chicago** October 1-6,1994

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28. Experience with 250 electrodes implanted in the cervical spine. 13th Annual meeting of the American Pain Society, **Miami**, November 10-13,1994

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34. Compressive myelopathy due to implanted spinal cord stimulation electrodes. Worldwide Pain Conference 2000,July 14-20, **San Francisco**, 2000

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33. Reliability of spinal cord stimulation devices: multicenter assessment. Proceedings of the 7th World Congress on Pain. Paris, August 22-27,1993

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39. Stimulation produced paresthesiae in spinal cord stimulation. Proceedings of 2nd congress of the International Neuromodulation Society. Goteborg, **Sweden**,, June 1-4 1994

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GIANCARLO BAROLAT, MD
NEUROSURGEON

COMPENSATION AND POLICY SUMMARY: DEPOSITIONS, PRETRIAL CONFERENCES AND COURT APPEARANCES

We wish to advise you of our current fees and policies concerning depositions, pretrial conferences and court appearances effective July 17, 2006.

Our fee record for review is $850.00 an hour. This is payable in advance and is nonrefundable. The same rate and policy applies to preparation time for conferences, depositions and court appearances.

Telephone conferences and personal conferences, all performed in the office are billed at $1000.00 an hour. A short conference within the first 30 minutes is billed at $500.00. All are scheduled in advance and must be paid at least fourteen days prior to the date of service. This fee is nonrefundable seven days prior to the date of service.

Depositions are $5000.00 for the first two hours with a two hour minimum plus any additional travel expenses if deposition is done away from office. Any additional time over the two hours will be billed at $1250.00 per hour in half hour increments. All are scheduled in advance and must be paid fourteen days prior to the date of service. This fee is nonrefundable seven days prior to the date of service.

Court appearances are $4500.00 per half day, payable fourteen days in advance. This fee shall be refunded in full if the court appearance is cancelled and we receive notice of such cancellation seven or more days prior to the date set. In the event of a cancellation within fewer than seven days before the scheduled appearance, no fee will be refunded. Any court appearance which runs over the half day (am or pm) will be payable for a full day at $9000.00 (i.e.; 11:00am to 2:00pm).

All payments shall be submitted by check and made out to the physician. Any variation to be made in this policy will be on a case by case basis and must be agreed to in writing before the variation is considered to be in effect. We require all prior arrangements for conferences, depositions and court appearances to be confirmed in writing by this office before an agreement is considered to be in effect. No confirmation shall be in effect until compensation is received.